ABSTRACT

A method of manufacturing a precision machine part, comprising the steps of: dividing a precision machine part into a plurality of pieces on an arbitrary face in the axial direction of a conveyance passage in which liquid or gas of a pipe line or cylinder passes; interposing a bonding alloy containing V in 1 to 10 atomic % between the divided faces; quickly heating by high frequency induction heating in an oxidizing atmosphere containing oxygen in not less than 0.01 mass%; and controlling a cooling rate after isothermal solidification.

Under the condition of holding a transient liquid phase diffusion bonding alloy containing one of B and P or both of B and P in 1 to 15 atomic % in total, also containing V in 1 to 10 atomic %, the balance being Fe and inevitable impurities, the transient liquid phase diffusion bonding alloy being capable of bonding in an oxidized atmosphere, the crystal structure of the transient liquid phase diffusion bonding alloy being substantially amorphous, the transient liquid phase diffusion bonding is conducted under the condition that the temperature is 900° to 1300°C, the surface pressure is 30 MPa at the maximum and the stress loading time is not less than 30 seconds.